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Public Understanding of Climate Science and the Ethics of Expertise

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Public Understanding of Climate Science and the Ethics of Expertise

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ABSTRACT: Public understanding of climate change turns significantly on epistemic trust and distrust of those claiming rational-social authority. Attending to the ethics of expert/non-expert trust relations and to argumentation and rhetoric in popular climate discourse, I argue, illustrates the importance of epistemic trustworthiness for the social propagation of climate scientific knowledge.

KEYWORDS: climate change, credibility, ethics, expertise, social epistemology, trust.

1. INTRODUCTION

Public understanding of climate change is a curious thing for social epistemological scrutiny. No subject of observation and conversation is more generic than the weather. Unlike chemical bonds, alleles, or leptons, many climatological phenomena make themselves apparent to the unaided inexpert eye. Strikingly, 19% of respondents to a 2008 survey identified "personal observations of warmer temperatures in their local communities" as their primary factor for belief in global warming, tied with glacial melting (19%) and changing weather patterns (18%) as most frequent answers (Borick, 2010, p. 33). For skeptics, personal observations (42%) was the most frequent factor identified for disbelief, well ahead of natural explanations (19%) and insufficient scientific evidence (11%) (Borick, 2010, p. 35). Both believing and disbelieving members of the American public are apparently looking to their own climate assessments as especially evidentially significant.

These things may tempt us into misunderstanding climate change as something we each can know on our own; yet the best evidence for climate change available to us doesn't admit of strictly independent individual assessment. As with much scientific knowledge, our grasp on anthropogenic climate change and appropriate responses to it turns on *epistemic dependence*: not only wary reliance on others' empirical or evaluative claims, but also relations of epistemic *trust*. Such dependencies include trust among climate researchers (no one of whom could do all the work alone) and public trust and distrust toward testimonies from those who earn—or claim—authority on global climate.

To be sure, public understanding of climate change is not monolithic but includes many *publics* with varying experiences, capabilities, and commitments. Yet would any of us be wise to pursue strict self-reliance on climatological beliefs? Consider me: even if I have good grasp of the greenhouse effect, this and my observations of local temperatures and weather patterns would be weak justification for any particular beliefs on global climate change. Whether my observations *even constitute* evidence for anthropogenic climate change and not another cause is unclear to my unaided evaluation; I cannot reliably judge its evidential

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relevance myself. As Hardwig (1994) emphasized in his work on epistemic dependency, it would be positively irrational of me to attempt strictly autonomous assessment, as it would be for one researcher to comprehensively measure global temperatures entirely by herself, neglectful of the rich social-evidential resource of trustworthy testimony.

Epistemic dependency may be recognized as useful, rational and responsible. When the scope of this dependency is obscured, however, expert and non-expert parties to trust relations are made vulnerable to exploitation of this trust. Vulnerability to exploitation of trust is urgent when the knowledge claims are political and controversial, as popular discourse continues to frame anthropogenic climate change. My hope is that by attending to the sometimes-neglected ethical dimensions of citizen-scientist epistemic dependency, understood in terms of trust and distrust, we may better appreciate how public understanding of climate change requires *trustworthiness*. Drawing on Baier and other trust theorists, I model public understanding of climate science as nested/overlapping trust relations, each with potential for promise and exploitation depending on their *moral health*. I find that the rhetoric and argumentation deployed in popular discourse on climate provide many illustrations for how untrustworthiness erodes the moral health of citizen-scientist epistemic dependency. I look to a range of climate-science testimonies including the recent dispute over climate science consensus between the Marshall Institute and the authors of *Merchants of Doubt*. In this way I offer a preliminary explication of role-specific duties of trustworthiness for morally and epistemically healthy public understanding of climate change.

2. TRUST AND CLIMATE SCIENCE

Solomon and Flores observed that trust relationships enable remarkable freedom: "not only the freedom from suspicion and distrust but the freedom to realize all sorts of possibilities … the freedom to engage in projects which one could not or would not undertake on one's own" (2001, pp. 7–8). This applies not only to business and personal relationships, but our collective understanding of global climatological phenomena as well. An enterprise necessarily broadly extended over space, time, and specialization, climate science is just the sort of project these authors recognize as made possible by mutual trust.

Solomon and Flores acknowledged their debt to Baier's work on trust, especially "Trust and Antitrust." Baier (1986) emphasized that trust is messy: it can be thrust upon us without consent, unrecognized by one or more parties to it, rational and irrational, morally healthy and rotten. Perhaps most important is her characterization of trust as a dependency distinctive from what she calls mere reliance. Specifically, Baier saw trust as not simply prediction and reliance on another's steady habits, but reliance by the trustor on the *good will* of the trusted toward her and the object of her trust. Characteristic of genuine trust relationships for Baier is its notable *discretion*: that is, the trusting person allows the other some discretion in determining how to meet her trust, such that the stronger the trust, the more discretion the trusted person is afforded (Baier, 1986, pp. 234–237). Discretion is the source of the powerful freedom noted by Solomon and Flores and also what renders the trustor vulnerable to betrayal as the merely reliant person is not. "One leaves others the opportunity to harm one when one trusts, and also shows one's confidence that they will not take it" (Baier, 1986, p. 235). *Rational* trust, then, requires "good grounds for such confidence in another's good will, or at least the absence of good grounds for expecting their ill will or indifference" (Baier, 1986, p. 235).

Karen Jones's (1996) account of trust as an *affective attitude* is also significantly indebted to Baier, though Jones did criticize Baier for neglecting the full significance of the trustor's *expectation* of the trusted's good will and responsiveness. Jones characterized trust as "an attitude of optimism that the good will and competence of another will extend to cover the domain of our interaction with her, together with the expectation that the trusted will be directly and favorably moved by the thought that we are counting on her" (1996, p. 4). She was less interested in any entrusted object than the situation of the trust relationship. Paul Faulkner (2007) offered a similar portrait in epistemology contrasting *affective* and *predictive* trust. In the latter, Faulkner noted, the listener trusts the speaker to do something in the sense that he knowingly expects *s*he'll be doing it, but doesn't expect anything *of* her. By contrast, trusting affectively means the listener actually expects that the speaker "recognizes his need to know whether *p*, and presumes that the speaker's telling him that *p* is a response to this" (Faulkner, 2007, p. 888).

Just as it is possible to merely rely without genuinely trusting, it is possible to learn from testimony without actually trusting it. We sometimes might find ourselves forced to rely on claims made by those we don't find trustworthy, perhaps because of the paucity of alternatives. In such situations we warily rely, as one might rely on *but not trust in* a damaged car to get to the hospital because it's the only available means. In these cases, we have not exactly opened ourselves to the possibility of *betrayal* since we have no real expectations of trustworthiness. To be sure, even without the vulnerability Baier identified as distinctive of trust, mere reliance on the unreliable can be costly. I may not be surprised when a shrimp cocktail at a bar in Iowa gives me food poisoning, but lack of betrayal may be modest solace.

The ampliative potential of epistemic trust as I here understand it means that trusting non-expert recipients of trustworthy expert testimony may acquire further grounds for belief beyond that available through mere-reliance alone. Consider the social-evidential significance of reflective belief in anthropogenic climate change by a supermajority of climate researchers. Here public trust and distrust by varied publics toward scientific opinion makes a big epistemic difference. Those who trust have reason to find great evidential significance in the percentage of scientists in agreement because we trust these scientists have come to their common beliefs not through deceit, conspiracy or groupthink but through their reflective expert assessments of empirical evidence, models, and fellow scientists' trustworthiness. Those who actively *distrust* climate scientists will place less evidential significance in lopsided expert opinion in favor of anthropogenic climate change. For example, Gardiner explained that novelist Michael Crichton, author of the conspiratorial climate-skeptical *State of Fear*, is dismissive of climate research because he "distrusts the data and methods of the scientists whose work is summarized by the IPCC" (2011, p. 460). Lastly consider a third public that neither trusts nor distrusts: they do not consider climate-scientific expert testimony trustworthy, neither do they dismiss it as untrustworthy. For this third group, lopsided opinion among scientists on climate change is a striking fact requiring explanation. Absent trust and distrust, they neither confidently attribute it to independent epistemic achievement nor to conspiracy.

3. MORAL ROT IN TRUST RELATIONSHIPS

"Most of us notice a given form of trust most easily after its sudden demise or serious injury. We inhabit a climate of trust as we inhabit an atmosphere and notice it as we notice air, only when it becomes scarce or polluted," Baier (1986, p. 234) observed. What is *polluted trust?*

Here Baier proposed what I consider an excellent moral test for trust relationships which we should extend to moral evaluations of citizen-scientist epistemic trust in public understanding of climate change. She articulated a test of the "moral decency" of trust relationships thusly:

> More generally, to the extent that what the truster relies on for the continuance of the trust relation is something which, once realized by the truster, is likely to lead to (increased) abuse of trust, and eventually to destabilization and destruction of the relation, the trust is morally corrupt.
>
> A trust relationship is morally bad to the extent that either party relies on qualities in the other which would be weakened by the knowledge that the other relies on them. (Baier, 1986, pp. 255-256)

Trustworthy citizen-scientist interdependency on climate change, I submit, should be able to pass Baier's expressibility test.

To illustrate let us consider the "skeptical environmentalist's guide to global warming," Lomborg's *Cool It*. The book opens with a striking claim: "Global warming has been portrayed recently as the greatest crisis in the history of civilization" (Lomborg, 2007, ix). For this claim the author has given no reference or citation. The reader has been immediately asked to trust: specifically to trust that this vivid description accurately captures the arguments of Lomborg's opponents, or perhaps another way of putting the point, to trust that 'greatest crisis historically' even *has* any actually advocating referent and is not just an arresting strawman. Whose view of global warming *is* this: a climate researcher in a peer-reviewed article, IPCC report, newsmagazine, Science *Times* article*,* anonymous blog post? The reader has been asked to trust the author that this claim has an advocate worth engaging; if that's not the case, the reader's engagement of the author's critique is predicated on ignorance of its strawman status.

A similar requirement of trust in the accurate characterization of unnamed opponents' views undergirded Patrick Michaels's criticism of what he calls "the Popular Vision" of global climate, in his 1992 book *Sound and Fury* published by the Cato Institute. The Popular Vision as Michaels described can be quite radical: for example, "One of the general tenets of those who subscribe to the Popular Vision is that there is a consensus among scientists that the end is at hand" (1992, p. 181). Readers have not been clearly informed what "the end is at hand" means, nor exactly to whom Michaels has ascribed this apocalyptic view; we have been implicitly invited to trust the author that the Popular Vision is not a strawman.

The rhetorical practice of putting a maligned view in quotation marks without reference to an actually identified advocate also turns for efficacy on the author-reader trust relationship. Notice: should these apparent quotes fail to have actually identifiable referents, continuance of this trust relationship is predicated on the reader's ignorance of that fact. In his introduction to *Climate Coup,* published by Cato, the editor said, "We are repeatedly told that 'the science is settled' on global warming (whatever that means) because of what is in our scientific journals" (Michaels, 2011, p. 1). Perhaps Michaels had in mind Oreskes (2004; 2007) on climate science consensus based on peer-reviewed climate research; but he didn't cite Oreskes or anyone else. Notice the rhetorical pull of Michaels's phrasing: 'the science is settled' has been introduced without an actually identified advocate *and belittled* as overly vague. Of course the vagueness criticism only works if readers can trust the author's implication that unnamed people of authority say this.

For another instance of apparent yet unattributed quotation, let us return to *Cool It.* "In public debates, the argument I hear most often is a variant of 'If global warming is going to kill us all and lay waste to the world, this has to be our top priority —everything else you talk

about, including HIV/AIDS, malnutrition, free trade, malaria, and clean drinking water may be noble but it is utterly unimportant compared to global warming'" (Lomborg, 2007, p. 124). Note that the argument relayed here (against which the author organized his book) has been given in quotation marks, inviting the reader to imagine actual advocates voicing the very words; indeed, we have been invited to imagine many different people frequently saying them to Lomborg's consternation. But since no reference is provided for these 'quoted' words, the reader must trust the author's implication that they accurately capture his adversaries' views. This is no small matter, since *Cool It* is built around the following thesis:

> That humanity has caused a substantial rise in atmospheric carbon-dioxide levels over the past centuries, thereby contributing to global warming, is beyond debate. What is debatable, however, is whether hysteria and headlong spending on extravagant CO_2-cutting programs at an unprecedented price is the only possible response. Such a course of action is especially debatable in a world where billions of people live in poverty, where millions die of curable diseases, and where these lives could be saved, societies strengthened, and environments improved at a fraction of the cost. (Lomborg, 2007, ix)

Note two dilemmas that have been presented in this passage. First, Lomborg has attributed (what he critiqued as a false dilemma) to unnamed experts the claim that we must commit to hysterical, extravagant, unprecedentedly expensive programs or do nothing. No advocate of carbon-cutting programs as essential would describe them as hysterical or extravagant, so Lomborg has rejected (as-yet uncited proponents') plans even in his very description of them. If the reader is to be moved, she must trust Lomborg's prior assessment that *actually advocated* programs are hysterical and extravagant. The second dilemma, Lomborg endorsed: *either* engage in CO_2-cutting programs *or* address urgent global problems of poverty and disease. Readers have not been given evidence why we must choose between these horns of the dilemma, nor evidence why global climate change should be thought unrelated to problems of global poverty, disease, conflict, and displacement. Again, readers have been implicitly asked to trust Lomborg's assessment of the dilemma as valid. The closest he comes to *arguing* for the dilemma is this generic assertion: "The world lacks the resources and will to solve all its major challenges. Focusing on some issues puts others on the back burner" (Lomborg, 2007, p. 47).

In these rhetorical choices readers are made vulnerable to potential exploitation of trust. Recall Baier's proposed test for moral rot. If in fact the presented dilemma is overly simplistic, if actually advocated emissions-reduction plans are not obviously hysterical or extravagant, if "the greatest crisis in the history of civilization" fails to accurately describe opponents' views or has no actual referent, then continuance of the trust relationship between author and readers is predicated on the author's reliance on readers' ignorance of these things.[*] The next sections consider the further vulnerabilities of trust in climate claims to moral rot: specifically regarding climate consensus, ascriptions of credibility, non-expert expectations, and abdication of good scientific communication skills across epistemic differences.

[*] Jean Goodwin argues that Lomborg is engaged in *advocacy*, and as such, does not invite a trust relationship with readers. This is intriguing and worth further attention, but as yet it is not clear to me that advocacy precludes trust.

4. CHARACTERIZATIONS OF CLIMATE-SCIENCE CONSENSUS

The epistemic asymmetry involved in citizen-scientist trust relationship makes them a rich social-epistemic resource but also enables their exploitation. When expert testifiers *depend* on their recipients' lack of expertise in order to propagate their favored interpretation, they fail Baier's moral test. When a trusted speaker or writer relies on trusting recipients' unfamiliarity with a range of alternatives on a disputed issue within a scientific community, for example, or relies on the fact that trusting recipients are unaware of one's own or others' credibility among experts, the attendant epistemic trust is morally corrupt. These problems are nicely illustrated, I think, by contemporary debate over the existence of a climate-science consensus.

Testimony reinforcing or challenging the idea of a climate science consensus need not raise special moral concerns; but it certainly *can,* when presented ambiguously, vaguely, in a way that preys on public ignorance of how consensus is being operationally defined.

Naomi Oreskes (2004; 2007) has defined climate science consensus in a way that is plausible, specific, and transparent. She has grounded her assessment of scientific consensus in comprehensive analysis of peer-reviewed journal articles published 1993–2003: approximately 900 articles on a search of "global climate change." Oreskes found that none were offered as refuting to the notion that "global climate change is occurring, and human activities are at least part of the reason why;" approximately one-fifth explicitly endorsed the view that anthropogenic climate change was the main force behind current climate change, approximately half affirmed this view implicitly (2004; 2007). This finding of climate-scientific consensus as operationally defined by peer-reviewed journal publication informed Oreskes's popular work with Conway (2008; 2010) and has been often cited in climate ethics as evidence against a real debate among climate scientists (cf. Garvey, 2008; Gardiner, 2011; Shrader-Frechette, 2011). We might contrast Oreskes's model of climate consensus with Bray (2010), who directly challenged her analysis by appealing to the results of three surveys, each with approximately 350-550 respondents of alleged climate scientists. Twenty years ago, Fred Singer similarly rejected a climate consensus by appealing to collected survey results (cf. Michaels, 1992, 181). Those who reject the idea of an expert climate science consensus frequently cite petitions, surveys, and private admissions of doubts (cf. Barth, 1998, pp. 8-9; Singer, 2000, p. 39).

For their part, Oreskes and Conway acknowledged and even emphasized in their historical analysis that there have been and still are some scientists like Fred Singer and Fred Seitz that argue contrary to the scientific consensus to build doubt about the extent of human contribution to climate change (2008; 2010). These skeptical claims have been given less through original peer-reviewed climate research, Oreskes and Conway observed, and more through other socially and politically influential channels of communication: newspaper or magazine editorials, letters to the editor, think-tank book publication and white papers, and private conversations with policymakers (2008; 2010). A principal target of criticism in *Merchants of Doubt* is the George C. Marshall Institute, an American think-tank with funding from tobacco, energy and other industry groups. Shortly after publication of *Merchants of Doubt*, the Marshall Institute gave a critical response to Oreskes and Conway's book through its newsletter. Titled "Clouding the Truth," it opened with a quote from Galileo—"In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual" — meant to set the tone.

O'Keefe and Kueter (2010) defended Seitz and other Marshall Institute colleagues as conscientious researchers pushing against scientific hegemony. The issue of consensus is key:

> First, Oreskes-Conway assert the importance of consensus – these scientists were on the wrong side of the scientific consensus, they state. Science is not a popularity contest and scientific history is replete with examples of consensus views that were flat-out wrong. Second, Oreskes-Conway say these scientists 'fought the scientific evidence.' That should surprise no one. In fact, if the opposite were true, we all should be very concerned. Challenging the theory, hypothesis, and evidence is after all, the basis of modern science. (O'Keefe & Kueter, 2010, p. 1)
>
> Nevertheless, Oreskes-Conway criticized Seitz, Jastrow, and Nierenberg for rejecting the scientific consensus that anthropogenic factors will cause dramatic climate change. To bolster their support for an alleged consensus, Oreskes-Conway offer a strong defense for the Intergovernmental Panel on Climate Change (IPCC). The recent Climategate revelations should be sufficient to give anyone pause when examining the openness and credibility of the IPCC process…In reality, the only consensus is among those on a [IPCC report] writing team. (O'Keefe & Kueter, 2010, p. 6)

Let us attend carefully to how O'Keefe and Kueter have been framing consensus. In insisting that science is "not a popularity contest," their implication was that Oreskes-Conway understand scientific consensus as what the majority of scientists endorse. While going by the numbers on experts' agreement can be a useful indicator of trustworthiness in facing conflicting testimony (cf. Goldman, 2001), this is not how Oreskes measured consensus, as we have seen. Though they imply that their colleagues "fought the scientific evidence" in noble scientific tradition, they do not remind readers that the fighting occurred outside of peer-reviewed publication. The issue of peer-reviewed research is not broached in this critique of *Merchants of Doubt*, despite the fact that the historians of science criticized for their climate consensus claim explicitly built their analysis from original peer-reviewed climate research.

O'Keefe and Kueter also implied that Oreskes-Conway's consensus claim depends on the IPCC report: if the credibility of the IPCC can be successfully impugned by reference to "Climategate," then presumably Oreskes-Conway's consensus claim is likewise impugned. Yet the force of this defense of the Marshall Institute turns on readers' ignorance of the fact that Oreskes's analysis of climate science consensus was neither a popularity contest nor parasitic on the IPCC anyway.

5. ASCRIPTIONS OF CREDIBILITY

An ethic of trustworthy scientific expertise should include the ways in which testifiers ascribe credibility (or lack thereof) to themselves, their allies, and their opponents.

Kristen Shrader-Frechette observed that "virtually no CC dissenters do peer-reviewed-expert climate research. Most of them are scientifically uninformed, and most are paid by special interests, like the oil lobby" (2011, p. 25). She argued that "scientists like Fred Seitz – who have never done climate research—have no authority from which to disagree with climate scientists who spend their lives doing advanced climate research" (Shrader-Frechette, 2011, pg. 25), described the Cato Institute, American Enterprise Institute, and Heartland Institute as "funded by chemical and fossil-fuel interests," and denounced scientists paid by these groups as decidedly untrustworthy (Shrader-Frechette, 2011, pp. 25–26). Retired physicist Fred Singer, she reminded us, has not published advanced climate research; similarly, despite his visibility as a climate critic biologist Patrick Michaels has not done climate research, and is paid by Cato, an "industry front group" largely funded by coal companies (Shrader-Frechette, 2011, p. 29).

Is this an *ad hominem* attack, distracting readers from engagement with the real issues? I don't think so. As Shrader-Frechette elucidated, the absence of original peer-reviewed

climate research and the presence of industry funding are, *taken together*, relevant to ascriptions of expert credibility. Without the fallible yet socially-epistemologically significant filter of peer review, non-expert recipients of these critics' skeptical testimonies must rely more directly on testifiers' good will and responsiveness. In this, testifiers' funding sources are quite relevant to assessing their affective trustworthiness for those of us not providing that funding.

By contrast let us consider Singer's climate-skeptical essay "Cool Planet, Hot Politics." Having cast suspicion on climate researchers funded by government grants, he noted:

> Of course there are think tanks on the other side as well (such as the Cato Institute and the Competitive Enterprise Institute), spreading the message that the best information available from climate science contradicts the alleged need for drastic policies certain to cause great economic harm. Needless to say, these groups don't get any government money. (Singer, 2000, p. 39)

The reader has been invited to regard the Cato Institute as especially trustworthy *because* it doesn't "get any government money." Yet Singer made no acknowledgement of Cato's own industry funding. He cannot consistently insist that Cato's funding is irrelevant to the credibility of its message *and* make the point in the quoted passage. Thus the author relied here for the force of his claim on readers' ignorance of Cato's industry funding.

A retired physicist like Singer, skeptical about anthropogenic climate change, need not be untrustworthy in choosing to testify publicly to his skeptical beliefs. Yet if he does so in a way that depends for its rhetorical force on public ignorance about how well his training and experience in physics prepares him to competently assess climatological research, this fails our test. Likewise, citing one's ideological allies to buttress one's position need not be problematic, but it becomes so when the efficacy of citation turns on readers' ignorance of these allies and their credibility.

6. RECIPIENTS, MEDIA, AND RELUCTANT POPULARIZERS

Shrader-Frechette observed that laypeople can be misled in several ways in misunderstanding climate change. One involves a failure of nonexpert recipients of testimony to appreciate the uncertainty inherent to science: laypeople "may be uncomfortable with uncertainty [and] may erroneously believe good science should be certain" (Shrader-Frechette, 2011, pp. 24–25), and dismiss fallible but reliable climate scientific knowledge. Public misunderstanding may be partially a media failure too, by giving a public platform to climate skeptics lacking real expert credibility in pursuit of superficial balance (Shrader-Frechette, 2011, p. 25; Gelbspan, 2000, p. 25). Public confusion may be a failure, thirdly, of scientists with climatological expertise yet poor communication skills. Shrader-Frechette put the point thusly:

> After all, advanced-scientific researchers are trained to do demanding technical work and make new discoveries, not to popularize science. They are trained to produce knowledge, not disseminate it. Indeed, if scientists become popularizers, they typically become suspect among other experts—who may think that they cannot do technically-demanding work. Poor expert communication thus can leave science open to misrepresentation. (2011, p. 24)

I take this to be an important point not to be overshadowed by the failures of trustworthiness by opportunistic climate skeptics already discussed in detail. Let us recall Jones's expectation criterion for trust. Trustworthy expert testimony means more than just transparency, reliability,

and absence of ill will; trustworthy expert facilitation of public scientific understanding means a conscientious responsiveness to trusting non-experts' expectation "that the one trusted will be directly and favorably moved by the thought that we are counting on her" (Jones, 1996, p. 4). When *trusting* scientists, we expect them to recognize themselves to be giving testimony, to recognize that they are making claims employed by us as evidence for our belief and actions. At its most trustworthy, scientific testimony is presented *conscientiously*: sincerely but further with attention to successful recipient uptake. In devaluing good science-popularization, then, otherwise fine scientists abdicate a duty of responsible testimony across epistemic difference and so fall short of trustworthiness.

7. CONCLUSION

To conclude, I have recommended that we be mindful of rhetorical considerations relevant to the moral health of epistemic trust relationships undergirding public understanding of climate. These include but are not limited to

- representations of opponents' commitments and claims
- operational definitions of climate science consensus
- ascriptions of credibility to oneself, allies, and opponents
- non-expert recipients' expectations of certainty
- expert researchers' conscientious communication skills

My remarks are only a partial articulation of what ethics of expertise may look like for morally healthy, mutually conscientious public trust on climate change. I have sought to illustrate the importance of reciprocal, role-specific *trustworthiness* by all parties to our nested, overlapping relationships of social-epistemic interdependency.

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